HALEAKALA NATIONAL PARK CRATER DISTRICT RESOURCES BASIC INVENTORY: INTRODUCTION AND GENERAL OVERVIEW

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The Crater District of Haleakala National Park lies between latitudes 20°41' and 20°46' N and longitudes 156°08' and 156°15' W. The crater is in fact an erosional feature where two amphitheater-headed valleys, Kaupo and Ko'olau (Keanae), met in the Pu'u Mamane to Kapalaoa area. Later flows of the Hana volcanic series obscured all but the most obvious features of the erosion.

The pre-contact Hawaiians used the crater area mainly as a transisland corridor later to be paved by Kihapiilani. Other uses, particularly religious and adze quarrying, were made of the area. The impact of this usage was minimal, involving minor disturbances of rocks and some fire-building.

After 1788, the impact in the area remained minimal until the Wilkes Expedition's (1840-1841) report described the summit and surrounding areas in somewhat melodramatic terms. The mountain had in fact been climbed 12 years earlier in 1828 by three missionaries. The silverswords were the first to suffer, as tourists collected them to verify their ascent (Bryan 1915). The establishment of the Rest House and later the Silversword Inn resulted in an escalation of the visitor impact on the silverswords. Perhaps the most unfortunate abuse was Maui's entry in Washington's Birthday Annual Floral Parade in 1911 in which a car was completely covered with large silverswords.

Later, cattle grazed in and were driven through the crater. Pasture improvement was encouraged, at least in the Kaupo Gap, by burning the vegetation. Goats have been established in the area for a long time. However, before the Second World War the problem was sufficiently acute that massive goat drives were organized. The impact of goats in Haleakala has been well documented by Yocum (1967). The problem is still as acute today as it was in the recorded past.

The lowest point of the Crater District is just below 4000 feet, the highest just over 10,000 feet. The majority of the area is above the inversion layer and a significant percentage is above the diurnal frost line at 8000 feet. One might ascribe

much of the xeric scrub and open to almost absent plant communities to extensive periods of drought. However, Whiteaker (pers. comm.) has evidence from climate diagrams which indicates that only at the Observatory is there any consistent drought period and then only for the month of June. The Paliku area has a climate diagram typical of a rain forest area. Thus other factors have to be identified to account for the paucity of vegetation. The acute disturbances previously alluded to are undoubtedly part of the explanation. Alpine ecosystems are notoriously slow to recuperate. The alpine edaphic factors and the paucity of soil in many areas are also contributing factors. It is my opinion that what we see today in Haleakala Crater is a meager remnant of the previous ecosystem. Even if the disturbances are eliminated the recovery will be an extremely slow process.

The objective of the Resources Basic Inventory was to identify all the plants and animals in the Crater District which would be presented as annotated lists. Distribution maps of individual species would also be produced. Resource management problems would also be identified and possible remedies discussed. Finally, a detailed vegetation map and description of the vegetation units would be produced.

The methodology of the Inventory was to use seven transects, five along a north-south axis and the other two along an approximately east-west axis. Study sites were established irregularly in areas along the transect which were obviously different from other areas. In all, 55 study sites were established. At each site, all species were recorded or collected, and their relative abundance using the Braun-Blanquet system was estimated. Observations and collections were made in numerous other localities not formally sampled.

The vegetation map and vegetation unit description program was conducted on a more formal basis. Potential vegetation units were later identifed, refined, and mapped from aerial photographs. The unit boundaries and authenticity were verified by visiting each delineated area. Formal sampling areas were then established in each vegetation unit, the vegetation sampled and soil and other environmental parameters measured.

Various aspects of these studies will be presented in the following papers. Six areas are covered and I ask you to bear with the very limited scope of information presented in each which is necessitated by the severe time constraints of the Conference.

LITERATURE CITED

Bryan, W. A. 1915. Natural History of Hawaii, Book 1. The Hawaiian Gazette Co., Honolulu. 596 pp.

Yocom, C. F. 1967. Ecology of feral goats in Haleakala National Park, Maui, Hawaii. Amer. Mid. Natur. 77: 418-451.